**RoHS** 

COMPLIANT

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Vishay General Semiconductor

# Surface Mount PAR® Transient Voltage Suppressors

High Temperature Stability and High Reliability Conditions



PRIMARY CHARACTERISTICS				
V <sub>BR</sub>	27 V			
P <sub>PPM</sub> (10 x 1000 μs)	3600 W			
PD	5 W			
V <sub>WM</sub>	22 V			
I <sub>RSM</sub>	70 A			
I <sub>FSM</sub>	500 A			
T <sub>J</sub> max.	175 °C			
Polarity	Uni-directional			
Package DO-218AB				

### **FEATURES**

- Junction passivation optimized design passivated anisotropic rectifier technology
- T<sub>1</sub> = 175 °C capability suitable for high reliability and automotive requirement
- Low leakage current
- Low forward voltage drop
- · High surge capability
- Meets ISO7637-2 surge specification
- · Meets MSL level 1, per J-STD-020, LF maximum peak of 245 °C
- AEC-Q101 gualified
- Material categorization: For definitions of compliance please see www.vishay.com/doc?99912

### **TYPICAL APPLICATIONS**

Use in sensitive electronics protection against voltage transients induced by inductive load switching and lighting, especially for automotive load dump protection application.

### **MECHANICAL DATA**

Case: DO-218AB

Molding compound meets UL 94 V-0 flammability rating Base P/NHE3 - RoHS-compliant, AEC-Q101 gualified

Terminals: Matte tin plated leads, solderable per J-STD-002 and JESD 22-B102

HE3 suffix meets JESD 201 class 2 whisker test

Polarity: Heatsink is anode

<b>MAXIMUM RATINGS</b> ( $T_A = 25 \text{ °C}$ unless otherwise noted)						
PARAMETER	SYMBOL	VALUE	UNIT			
Peak pulse power dissipation with 10/1000 µs waveform	P <sub>PPM</sub>	3600	W			
Power dissipation on infinite heatsink at $T_C = 25$ °C (fig. 1)	PD	5.0	W			
Non-repetitive peak reverse surge current for 10 µs/10 ms exponentially decaying waveform	I <sub>RSM</sub>	70	А			
Maximum working stand-off voltage	V <sub>WM</sub>	22.0	V			
Peak forward surge current 8.3 ms single half sine-wave	I <sub>FSM</sub>	500	А			
Operating junction and storage temperature range	T <sub>J</sub> , T <sub>STG</sub>	-55 to +175	°C			

ELECTRICAL CHARACTERISTICS (T <sub>A</sub> = 25 °C unless otherwise noted)					
DEVICE TYPE	BREAKDOWN VOLTAGE V <sub>BR</sub> AT I <sub>T</sub> (V)			STAND-OFF VOLTAGE	
	MIN.	MAX.	(mA)	(¥)	
SM5A27	24	30	10	22	

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Document Number: 88381

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<b>ADDITIONAL CHARACTERISTICS</b> ( $T_A = 25 \text{ °C}$ unless otherwise noted)							
PARAMETER	TEST CONDITIONS	SYMBOL	MIN.	TYP.	MAX.	UNIT	
Zener voltage temperature coefficient	I <sub>Z</sub> = 10 mA	V <sub>ZTC</sub>	-	-	36	mV/°C	
Clamping voltage for 10 µs/10 ms exponentially decaying waveform	I <sub>PP</sub> = 55 A	V <sub>C</sub>	-	-	40.0	V	
Instantaneous forward voltage	I <sub>F</sub> = 6.0 A	V <sub>F</sub> <sup>(1)</sup>	-	-	1.0	v	
	I <sub>F</sub> = 100 A		-	0.95	-		
Reverse leakage current	Rated V <sub>WM</sub> T <sub>J</sub> = 25 °C	- I <sub>R</sub>	-	-	0.2	μA	
	T <sub>J</sub> = 175 °C		-	-	10.0		

Note

<sup>(1)</sup> Measured on a 300 µs square pulse width

<b>THERMAL CHARACTERISTICS</b> ( $T_A = 25 \degree C$ unless otherwise noted)				
PARAMETER		VALUE	UNIT	
Typical thermal resistance, junction to case	$R_{ ext{ heta}JC}$	1.0	°C/W	

ORDERING INFORMATION (Example)				
PREFERRED P/N	UNIT WEIGHT (g)	PREFERRED PACKAGE CODE	BASE QUANTITY	DELIVERY MODE
SM5A27HE3/2D <sup>(1)</sup>	2.505	2D	750	13" diameter plastic tape and reel, anode towards the sprocket hole

Note

(1) AEC-Q101 qualified

#### **RATINGS AND CHARACTERISTICS CURVES**

(T<sub>A</sub> = 25 °C unless otherwise noted)

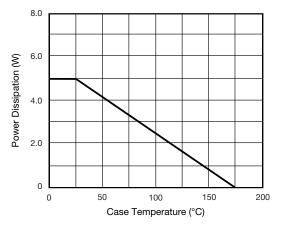


Fig. 1 - Power Derating Curve

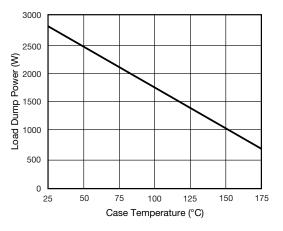
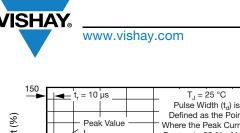


Fig. 2 - Load Dump Power Characteristics (10 ms Exponential Waveform)





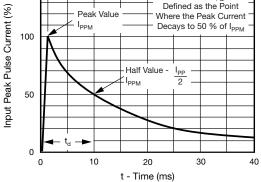


Fig. 3 - Pulse Waveform

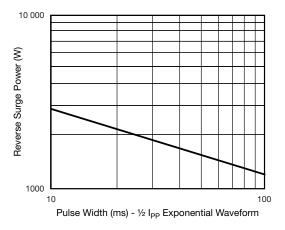


Fig. 4 - Reverse Power Capability

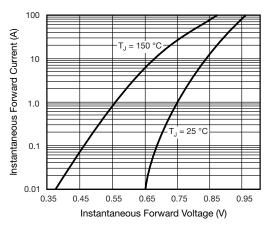


Fig. 5 - Typical Instantaneous Forward Characteristics

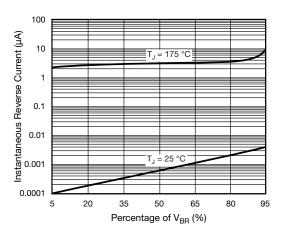


Fig. 6 - Typical Reverse Characteristics

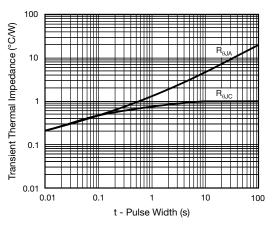


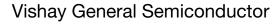
Fig. 7 - Typical Transient Thermal Impedance

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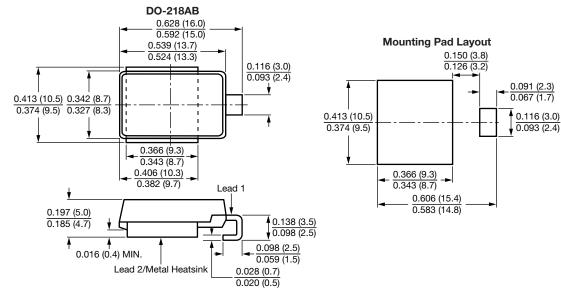
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### PACKAGE OUTLINE DIMENSIONS in inches (millimeters)





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